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In vitro and in vivo approaches to the study of Alzheimer's disease

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Alzheimer's disease (AD) is a progressive brain disorder that slowly leads to memory loss and cognitive decline. It is considered the most common cause of dementia in the elderly population, with an incidence and related cost of medical care that are expected to increase in the next future. However, none of the pharmacologic treatments available today for AD dementia is able to stop the neurodegeneration that causes the common symptoms of the disease.
This lack of effective cure has led to the need of new biomarkers to be used in early diagnosis and new molecular target to address interventions.
We have recently focused our work on the study of HSP60 as a new potential target for AD. By the use of in vitro and in vivo techniques we found that AD conditions affect the expression level and localization of the protein, in primary neuronal cultures. We also observed that decreased level of HSP60 in neuronal cells, positively correlate with IGF-1Rs expression, which are known to be downregulated in AD post-mortem brains (Talbot et al., 2012).
According to recent data of the literature, we investigated the modulation of HSP60 in an in vitro model of insulin resistance, in order to better understand its involvement in the downregulation of IGF1R observed in AD brain and in the other molecular mechanisms shared by Alzheimer's and Type II diabetes (De La Monte et al 2012; Giuffrida et al., 2012).
Starting from these new data and in the light of our previous results, the main point of this presentation, will be the relevance of IGF-1 receptor and its downstream effectors in AD progression, with particular focus on the experimental techniques commonly used by our group to study Alzheimer's disease.

References:

1. Talbot K., Wang HY, J Clin Invest. 2012, 4, 1316-38.
2. De La Monte SM., Front Biosci (Elite Ed), 2012, 4, 1582-1605.
3. Giuffrida ML., Mol Neurobiol, 2012, 46, 605-13.

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